

Confined Spaces



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Confined Spaces

Learning Objectives

- Define "CONFINED SPACE"
- Recognize hazards associated with confined space entry and how they may change. {Confined Space Database}
- Discuss the abnormal behavior and emergency procedures associated with confined space entries.
- Understand your role and responsibilities as it applies to Fermilab Program



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Learning Objectives - Continued

- Know ES&H procedures and requirements found in contract documents and FESHM
- Given a sample entry permit, identify inconsistencies, incomplete and invalid data
- Discuss the proper techniques for monitoring Confined Spaces.
- Know where to go for help and assistance



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What is a “confined space”?

- Is large enough and so configured that an employee can bodily enter and perform assigned work; and
- Has limited or restricted means for entry or exit; and
- Is not designed for continuous employee occupancy.



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Examples of confined spaces

- | | |
|----------------|-------------|
| • Tanks | • Vaults |
| • Vessels | • Pits |
| • Silos | • Sewers |
| • Storage Bins | • Septic |
| • Manholes | • Pipelines |



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Permit Required Confined Spaces

- Contains or has a potential to contain a hazardous atmosphere;
- Contains a material that has the potential for engulfing an Entrant;
- Has an internal configuration such that an Entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section; or
- Contains any other recognized serious safety or health hazard.



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What The Statistics Tell Us

- Over 200 confined space fatalities annually
- 60% are would-be rescuers
- Nearly 90% die of suffocation
- More than 95% had no formal training
- **They all could have been prevented!!!!!!**



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Dangers of Confined Spaces

- Personnel did not recognize a permit required confined space
- Personnel trusted their senses
- Personnel underestimated the danger
- Personnel did not stay on guard
- Personnel tried to rescue others



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Hazards in Confined Spaces

- Hazardous Atmospheres
 - Oxygen Deficient and Enrichment
 - Flammable and Combustibles
 - Toxic Gases and Vapors



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Other Hazards in Confined Spaces

- Electrical Shock
- Flooding
- Slippery and/or sloped surfaces
- Restricted Access/Egress
- Moving Equipment
- Falls
- Poor illumination
- Temperature Extremes



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Signs and Symptoms of an Exposure to a Hazard

- Dizzy, Faint, Lightheaded
- Difficult Breathing
- Suddenly Feel Tired
- Cool, Clammy Skin
- Nauseous
- Face Suddenly Feels Flush
- Burning Eyes or Skin
- Having Difficulty Focusing
- Itching, Sneezing

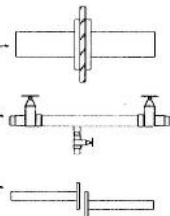


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Hazard Control

- Isolation procedures
 - Blanking/blinding
 - Double block and bleed
 - Line breaking
- Energy control
 - LOTO (ZMS)
- Ventilation



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Roles and Responsibilities

- The main players:
 - Entry Supervisor
 - Authorized Attendant
 - Authorized Entrant
 - Fermilab Fire Dept.
- The secondary players:
 - Subcontractors
 - Task Manager
 - Construction Coordinator
 - ES&H Section
 - Divisions/Sections and ES&H Groups



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Entry Supervisor

- Definition
 - The person (such as the employer, foreman or Task Manager) responsible for determining if acceptable entry conditions are present where entry into a confined space is planned, for authorizing and overseeing entry operations, and for terminating entry.



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Entry Supervisor - Continued

- Responsibilities
 - Determines whether a confined space is involved for each task under his/her supervision and complete any required permits.
 - Ensures the entry permit contains the required information before authorizing or allowing entry.
 - Ensures that the procedures, practices and equipment necessary for safe entry are in effect before allowing entry.



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Entry Supervisor - Continued

- Responsibilities

- Ensures that employees who work as authorized Entrants and Attendants are trained.
- Informs authorized Entrants of the required personal protective equipment (PPE) and informs on the proper use of the PPE.
- Ensures at specified intervals throughout the access, that entry operations and conditions remain consistent with the terms of the entry permit.



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Entry Supervisor - Continued

- Responsibilities

- Cancels the entry authorization and terminates entry when acceptable conditions are not present. Notifies Landlord and Functional Landlord.
- Takes the necessary measures for concluding an entry operation and canceling the permit once the work authorized by the permit has been completed.
- Notifies other affected personnel such as the local building/area manager, Fire Department, Landlord and Functional Landlord prior to entry.
- May serve as attendant or entrant.



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Authorized Attendant

- Definition

- Any **trained** employee, subcontractor, or user who is stationed and remains outside of the confined space for the purpose of monitoring the Entrants and who performs all Attendant's duties.



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Authorized Attendant - Continued

- Responsibilities
 - Maintains an accurate count of all Entrants
 - Can recognize potential confined space hazards
 - Can recognize signs and symptoms of a hazardous exposure
 - Performs continuous air monitoring of space
 - Performs non-entry retrievals if trained on equipment



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Authorized Attendant - Continued

- Responsibilities - Continued
 - Maintains effective and continuous contact with authorized Entrants
 - Ensures Entrant is protected from external hazards
 - Notifies the Fermilab Fire department in case of emergency
 - Performs no duties that might interfere with the Attendant's primary responsibility of monitoring the Entrants



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Authorized Attendant - Continued

- Responsibilities - Continued
 - Orders Entrant(s) to evacuate the confined space immediately upon observing any of the following:
 - conditions which are not authorized by permit
 - detects signs/symptoms of hazard exposure
 - detects hazardous situation outside
 - the Attendant cannot effectively and safely perform all duties required
 - Serves as Bouncer in case of entry by unauthorized persons and notifies entrants and entry supervisor



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Authorized Entrant

- Definition

- Any **trained** employee, subcontractor, or experimenter who enters a confined space.



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Authorized Entrant - Continued

- Responsibilities

- Knows the hazards that may be encountered
- Use safety equipment properly, this may include monitoring equipment
- Maintain communication with Attendant
- Alert Attendant whenever:
 - recognizes any warning sign and/or symptom of exposure to a dangerous situation
 - detection of a prohibited condition



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Authorized Entrant - Continued

- Responsibilities - Continued

- Exit from a confined space as quickly as possible whenever:
 - an order to evacuate is given by the Attendant
 - recognizes any warning sign and/or symptom of exposure to a dangerous situation
 - detection of a prohibited condition
 - an evacuation alarm is activated



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Fermilab Fire Department

- Performs entry required rescues from confined spaces
- Annually practices making confined space rescues



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Subcontractors

- The subcontractor shall provide the Fermilab Construction Coordinator/Task Manager (FCC/TM) with the following:
 - Written copy of their confined space program.
 - Training records for potential Entrants, Attendants, and Entry Supervisors.
 - Evidence that all air monitoring equipment is properly calibrated.
- Subcontractor shall follow all Fermilab safety policies.



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Subcontractors - Continued

- Subcontractor shall provide their own PPE, such as lifelines, harnesses, respirators, tripods, ventilators.
- If the subcontractor can demonstrate that continuous forced air ventilation alone is sufficient to maintain safe entry conditions, then the job specific confined space entry procedures can be modified by the Landlord ES&H Department.



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Subcontractors - Continued

- Each subcontractor who is retained to perform permit space entry operations shall:
 - Obtain available information regarding permit space hazards and entry operations from the FCC/TM.
 - Coordinate entry operations with FCC/TM when working along side Fermilab employees.
 - Prior to entry, inform FCC/TM of the specific permit space procedures the subcontractor will follow.



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Subcontractors - Continued

Subcontractor must also:

- Inform FCC/TM prior to entering the space
- Inform FCC/TM of any unanticipated hazards confronted during the confined space entry.
- Provide copy of permit, reclassification form or written certification once the work has been completed.



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Task Manager/ Construction Coordinator

- Informs subcontractors of the confined space and that a permit system is required
- Appraise subcontractors of hazards
- Appraise subcontractors of any precautions or procedures
- Ensures that activities are completed in accordance with subcontractor's confined space entry program.



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Task Manager/ Construction Coordinator - Continued

- Coordinate entry operations
- Notifies Fire Department, Landlord and Functional Landlord ES&H Departments prior to entry.
- Debrief the subcontractor at the conclusion



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ES&H Section

- Provides a uniform confined space training program
- Provide expertise to Divisions/Sections
- Provides a supply of signs to denote confined spaces
- Maintains lab-wide confined space database on the [ES&H Web-page](#)



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Divisions/Sections and ES&H Group

- Implements Confined Space Entry program.
- Develops confined space entry notification methods and documents Landlord ES&H Department's signature approval requirements.
- Maintain inventory of confined spaces for which they are landlord on the [ES&H Web-page](#).
- Provide Fermilab specific training (i.e., radiation)



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Divisions/Sections and ES&H Group - Continued

- Provide all available information on confined space to be entered to the Confined Space Entry Team, Task Manager and Construction Coordinator
- Ensure that the confined spaces are labeled
- Annual review of confined space program and permits
- Maintains and calibrates monitoring equipment



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Entry Permits

- Entry Supervisor/Task Manager shall ensure the completion of the entry permit. Complete as team.
- The duration of permit is for the length of the job, so long as the conditions remain the same
- In the event that unacceptable conditions arise, the Attendant will order an evacuation and inform the Entry Supervisor. The permit will be void and a re-evaluation will be required by the division/section senior safety officer or designee



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Entry Permits - Continued

- All significant identifiable hazards shall be listed
- If there is a shift change or multiple day jobs or change in Entrants/Attendants, a roster of Entrants/Attendants should be attached to the permit
- Air monitoring records must be recorded on the permit
- All canceled confined space permits shall be retained for one year by the D/S making the entry



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Reclassification Form

- A Permit-Required Confined Space may be reclassified as a Non-Permit Confined Space by an individual trained in confined space entry after the following provisions have been met:
 - No actual or potential atmospheric hazard exists (determined following initial atmospheric testing).
 - All other recognized serious safety or health hazards must be eliminated without entry into the space.



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Reclassification Form - Continued

- The basis for determining that all hazards have been eliminated must be documented using the Confined Space Reclassification Form from the ES&H Website.
- All completed confined space reclassification forms shall be retained by the division/section making the entry for a minimum of one (1) year.
- The Landlord and Functional Landlord ES&H Departments and Fire Department shall be notified prior to entry.



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Key Program Requirements

- Use the permit and reclassification forms as planning tools
- Identify and evaluate potential hazards
- Manage the hazards
- Use only trained personnel
- Always utilize an attendant under permit entries
- Establish communications with entrants



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Key Program Requirements

- Continuously monitor the atmosphere
- Record monitor readings
- Observe for changing conditions
- Develop an emergency plan
- Post the permit
- Review program on an annual basis



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Help/Assistance

- Contract
- Hazard Analysis Form
- Division/Section ES&H Groups
- ES&H Section Web-Page: www-esh.fnal.gov
 - FESHM Chapter 5063
 - Confined Space Flowchart
- ES&H Section



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Summary

- We defined confined spaces
- Hazards make the confined spaces a permit required
- Discussed Roles and Responsibilities
- The importance of a fully completed Entry Permit or Reclassification Form
- Where to turn for help and assistance



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